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ABSTRACT

1
2 (S) Two embodiments of a multilayered low energy optical power limiter device are
3 disclosed which protect thermal sensors against laser threats in the far infrared spectral
4 region. One limiter device has multiple layers in order from the incoming radiation side
5 an antireflective coating layer, a window substrate layer, a layer of chalcogenide, a
6 germanium substrate layer, a layer of vanadium dioxide (VO_2), a window substrate, and
7 an antireflective coating layer. As incoming radiation energy increases, the VO_2 layer
8 will heat up and change from an unswitched transmissive state to a switched reflective
9 state. The excessive energy past the switched state is reflected back through the
10 germanium and chalcogenide layer and is absorbed quickly therein so that these layers
11 also heat up quickly and are switched almost simultaneously with the VO_2 layer to
12 provide high optical density at a low switching threshold temperature with high damage
13 threshold. The second embodiment further adds a second VO_2 layer between the input
14 antireflective coating layer and window substrate layers to reflect high radiation energy
15 immediately.

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